

SEQUENCE LISTING

<110> Adamou, John
Choi, Gil

<120> Streptococcus Pneumoniae Proteins and Vaccines

<130> 469201-589

<140>
<141>

<150> US/09/590,991

<151> 2000-06-09

<150> US/60/138,453

<151> 1999-06-10

<160> 8

<170> PatentIn Ver. 2.0

<210> 1

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Forward primer
for PCR amplification of Sp128 genomic sequences

<400> 1

tacccggtag tcttagcaga c

21

<210> 2

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Reverse primer
for PCR amplification of Sp128 genomic sequence

<400> 2

atagccataa gttgatttgc catta

25

<210> 3

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Forward primer
for PCR amplification of Sp130 genomic sequence

<400> 3

aagcttggcg agattgcaga a

21

<210> 4
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Reverse primer
for PCR amplification of Sp130 genomic sequence

<400> 4
cttatttagga ttgttagtag ttgattt

27

<210> 5
<211> 1992
<212> DNA
<213> Streptococcus pneumoniae

<400> 5
taccggtag tcttagcaga cacatctagc tctgaagatg cttaaacat ctctgataaa 60
gaaaaagtag cagaaaataa agagaaaacat gaaaatatcc atagtgttat gaaaacttca 120
caggatttt aagagaagaa aacagcagtc attaaggaaa aagaagttgt tagaaaaat 180
cctgtgatag acaataacac tagcaatgaa gaagaaaaaa tcaaagaaga aaattccaat 240
aaatcccaag gagattatac ggactcattt gtgaataaaa acacagaaaa tcccaaaaaaa 300
gaagataaaag ttgtctatat tgctgaattt aaagataaaag aatctggaga aaaagcaatc 360
aaggaactat ccagtcttaa gaatacaaaa gttttatata cttatgatag aatttttaac 420
ggttagtgc tagaaacaac tccagataac ttggacaaaa tttaaacaat agaaggtatt 480
tcatcggtt aaagggcaca aaaagtccaa cccatgatga atcatgccag aaaggaaatt 540
ggagttgagg aagctattga ttacctaag tctatcaatg ctccgttgg gaaaaatttt 600
gatggtagag gtatggcat ttcaaatatc gatactggaa cagattatag acataaggct 660
atgagaatcg atgatgatgc caaagcctca atgagattt aaaaagaaga cttaaaaggc 720
actgataaaa attattgggtt gagtgataaa atccctcatg cgttcaatta ttataatggt 780
ggcaaaaatca ctgtagaaaa atatgatgat ggaaggatt atttgaccc acatggatg 840
catattgcag ggattcttgc tggaaatgat actgaacaag acatcaaaaa ctttaacggc 900
atagatggaa ttgcaccta tgacacaaatt ttcttcatca aaatgtattc tgacgcagga 960
tctgggtttc cgggtgatga aacaatgtt catgttattt aagattctat caaacacaac 1020
gtttagtgg tttcggtatc atctggttt acaggaacag gtctgttagg tgagaaaaat 1080
tggcaagcta ttccggcatt aagaaaagca ggcattccaa tgggtgtcgc tacggtaac 1140
tatgcactt ctgcttcaag ttcttcatgg gattttagtag caaataatca tctgaaaatg 1200
accgacactg gaaatgtaac acgaactgca gcacatgaag atgcgatacg ggtcgcttct 1260
gctaaaaatc aaacagttaa gtttgataaa gttAACatAG gtggagaaag ttttaataac 1320
agaaaatatacg gggcctttt cgataagagt aaaatcacaa caaatgaaga tggacaaaaaa 1380
gctcttagta aattaaaatt tttatataa ggcaaggggc aagaccaaga tttgataggt 1440
ttggatctt gggcaaaaat tgcagtaatg gatagaattt atacaaggaa tttaaaaaat 1500
gctttaaaaa aagctatgga taagggcgtca cgcgcattt tgggtgtaaa tactgttaat 1560
tactacaata gagataattt gacagagctt ccagctatgg gatatgaagc ggtgtttttt 1620
actaaaagtc aagtgtttt aatttcagga gatgtatgg taaagctatg gaacatgatt 1680
aatcctgata aaaaaactga agtcaaaaaga aataataaaag aagattttaa agataaaattt 1740
gagcaataact atccaatttga tatggaaatgtttaattcca acaaaccgaa tggtaggtgac 1800
gaaaaagaga ttgactttaa gtttgcaccc gacacagaca aagaactcta taaagaagat 1860
atcatcggtt cagcaggatc tacatcttgg gggccaagaa tagattttact tttaaaaaccc 1920
gatgtttcag cacctggtaa aaatattaaa tccacgctt atgttattaa tggcaaatca 1980
acttatggct at 1992

<210> 6
<211> 664
<212> PRT
<213> Streptococcus pneumoniae

<400> 6

Tyr Pro Val Val Leu Ala Asp Thr Ser Ser Ser Glu Asp Ala Leu Asn
1 5 10 15

Ile Ser Asp Lys Glu Lys Val Ala Glu Asn Lys Glu Lys His Glu Asn
20 25 30

Ile His Ser Ala Met Glu Thr Ser Gln Asp Phe Lys Glu Lys Lys Thr
35 40 45

Ala Val Ile Lys Glu Lys Glu Val Val Ser Lys Asn Pro Val Ile Asp
50 55 60

Asn Asn Thr Ser Asn Glu Glu Ala Lys Ile Lys Glu Glu Asn Ser Asn
65 70 75 80

Lys Ser Gln Gly Asp Tyr Thr Asp Ser Phe Val Asn Lys Asn Thr Glu
85 90 95

Asn Pro Lys Lys Glu Asp Lys Val Val Tyr Ile Ala Glu Phe Lys Asp
100 105 110

Lys Glu Ser Gly Glu Lys Ala Ile Lys Glu Leu Ser Ser Leu Lys Asn
115 120 125

Thr Lys Val Leu Tyr Thr Tyr Asp Arg Ile Phe Asn Gly Ser Ala Ile
130 135 140

Glu Thr Thr Pro Asp Asn Leu Asp Lys Ile Lys Gln Ile Glu Gly Ile
145 150 155 160

Ser Ser Val Glu Arg Ala Gln Lys Val Gln Pro Met Met Asn His Ala
165 170 175

Arg Lys Glu Ile Gly Val Glu Ala Ile Asp Tyr Leu Lys Ser Ile
180 185 190

Asn Ala Pro Phe Gly Lys Asn Phe Asp Gly Arg Gly Met Val Ile Ser
195 200 205

Asn Ile Asp Thr Gly Thr Asp Tyr Arg His Lys Ala Met Arg Ile Asp
210 215 220

Asp Asp Ala Lys Ala Ser Met Arg Phe Lys Lys Glu Asp Leu Lys Gly
225 230 235 240

Thr Asp Lys Asn Tyr Trp Leu Ser Asp Lys Ile Pro His Ala Phe Asn
245 250 255

Tyr Tyr Asn Gly Gly Lys Ile Thr Val Glu Lys Tyr Asp Asp Gly Arg
260 265 270

Asp Tyr Phe Asp Pro His Gly Met His Ile Ala Gly Ile Leu Ala Gly
275 280 285

Asn Asp Thr Glu Gln Asp Ile Lys Asn Phe Asn Gly Ile Asp Gly Ile
290 295 300

Ala Pro Asn Ala Gln Ile Phe Ser Tyr Lys Met Tyr Ser Asp Ala Gly
305 310 315 320

Ser Gly Phe Ala Gly Asp Glu Thr Met Phe His Ala Ile Glu Asp Ser
325 330 335

Ile Lys His Asn Val Asp Val Val Ser Val Ser Ser Gly Phe Thr Gly
340 345 350

Thr Gly Leu Val Gly Glu Lys Tyr Trp Gln Ala Ile Arg Ala Leu Arg
355 360 365

Lys Ala Gly Ile Pro Met Val Val Ala Thr Gly Asn Tyr Ala Thr Ser
370 375 380

Ala Ser Ser Ser Trp Asp Leu Val Ala Asn Asn His Leu Lys Met
385 390 395 400

Thr Asp Thr Gly Asn Val Thr Arg Thr Ala Ala His Glu Asp Ala Ile
405 410 415

Ala Val Ala Ser Ala Lys Asn Gln Thr Val Glu Phe Asp Lys Val Asn
420 425 430

Ile Gly Gly Glu Ser Phe Lys Tyr Arg Asn Ile Gly Ala Phe Phe Asp
435 440 445

Lys Ser Lys Ile Thr Thr Asn Glu Asp Gly Thr Lys Ala Pro Ser Lys
450 455 460

Leu Lys Phe Val Tyr Ile Gly Lys Gly Gln Asp Gln Asp Leu Ile Gly
465 470 475 480

Leu Asp Leu Arg Gly Lys Ile Ala Val Met Asp Arg Ile Tyr Thr Lys
485 490 495

Asp Leu Lys Asn Ala Phe Lys Lys Ala Met Asp Lys Gly Ala Arg Ala
500 505 510

Ile Met Val Val Asn Thr Val Asn Tyr Tyr Asn Arg Asp Asn Trp Thr
515 520 525

Glu Leu Pro Ala Met Gly Tyr Glu Ala Asp Glu Gly Thr Lys Ser Gln
530 535 540

Val Phe Ser Ile Ser Gly Asp Asp Gly Val Lys Leu Trp Asn Met Ile
545 550 555 560

Asn Pro Asp Lys Lys Thr Glu Val Lys Arg Asn Asn Lys Glu Asp Phe
565 570 575

Lys Asp Lys Leu Glu Gln Tyr Tyr Pro Ile Asp Met Glu Ser Phe Asn
580 585 590

Ser Asn Lys Pro Asn Val Gly Asp Glu Lys Glu Ile Asp Phe Lys Phe
595 600 605

Ala Pro Asp Thr Asp Lys Glu Leu Tyr Lys Glu Asp Ile Ile Val Pro
610 615 620

Ala Gly Ser Thr Ser Trp Gly Pro Arg Ile Asp Leu Leu Leu Lys Pro
625 630 635 640

Asp Val Ser Ala Pro Gly Lys Asn Ile Lys Ser Thr Leu Asn Val Ile
645 650 655

Asn Gly Lys Ser Thr Tyr Gly Tyr
660

<210> 7

<211> 2319

<212> DNA

<213> Streptococcus pneumoniae

<400> 7

aagcttgcgc agattgcaga atctaaattt aaaaattttag gaaatggaaa agagggtagt 60
ctaaaaaaag atacaactgg ggtagaacat catcatcaag aaaatgaaga gtctattaaa 120
gaaaaatcta gtttactat tgatagaat atttcaacaa ttagagactt tgaaaataaa 180
gacttaaaga aactcattaa aaagaaaattt agagaagttg atgattttac aagtgaaact 240
ggtaagagaa tggaggaata cgattataaa tacatgata aaggaaatat aatagcctac 300
gatgatggga ctgatctaga atatgaaact gagaaacttg acgaaatcaa atcaaaaatt 360
tatgggttca taagtccgtc taaagatgga cacttggaa ttcttggaaa gataagtaat 420
gtttctaaaa atgccaaggt atattatggg aataactata aatctataga aatcaaagcg 480
accaagtatg atttccactc aaaaacgatg acatttgatc tatacgctaa tattaatgat 540
attgtggatg gattagctt tgcaggagat atgagattat ttgtttaaaga taatgatcag 600
aaaaaaagctg aaattaaaat tagaatgcct gaaaaaattt aggaaactaa atcagaatat 660
ccctatgtat caagttatgg gaatgtcata gaatttaggg aaggagatct ttcaaaaaac 720
aaaccagaca atttaactaa aatgaaatct ggtaaaatct attctgattc agaaaaaaca 780
caatatctgt taaaggataa tatttcata agaaaaggct atgcactaaa agtactacc 840
tataatctgt gaaaaacgga tatgttagaa ggaaatggag tctatagcaa ggaagatata 900
gcaaaaatac aaaaggccaa tcctaatcta agagcccttt cagaaacaac aatttatgct 960
gatagttagaa atgttgaaga tggagaagat acccaatctg tattatgtc ggcttggac 1020
ggctttaaca ttataaggta tcaagtgtt acattttaaa tgaacgataa agggggagct 1080
atcgataaag acggaaatct tgcacat tttctaaac ttgttatttt tggtaaggat 1140
gataaaagaat acactggaga ggataagttc aatgttagaaat ctataaaaga agatggctcc 1200
atgttattt ttgataccaa accagtaaac ctttcaatgg ataagaacta tttaatcct 1260
tctaaatcta ataaaattt tgcacat ccagaatttt atttaagagg taagatttt 1320
gataagggtg gttttactg ggaattgaga gttaatgaaat cgggtttaga taattattt 1380
atctacggag atttacacat tgataacact agagattttt atattaagct gaatgttaaa 1440
gacgggtgaca tcatggactg gggaaatgaaa gactataaag caaacggatt tccagataag 1500
gtaacagata tggatggaaa tggatgtt ctttctt caaactggct atagcgattt gaatgttaaa 1560
gcagggtgg tccactatca gttttatata gataatgtt aaccggaaat aaacattgt 1620
ccataaggaa atactatgtt cgaatatgtt gatggaaaat ctgttgc ttaacatcaat 1680
gataaaagaa ataatggatt cgtatgtt gatggaaaat ctttgc ttaacatcaat 1740
aaagaatata catcattaa tgcattttt caaataatggat acaagacact aaacattttt 1800
attgttgc aagatttttgc aagaaataca accgtttttt aatttttgc ttaacatcaat 1860
acggggaggtaatgtt aaaaacccat aggtaactg tgaccattca aaatggaaa 1920
gaaatgttgc caacgttgc gttttttttt tacatgttta taagggtgaa 1980
ttgggggggg gatccaattt tgcattttttt gaaattttttt gtttgc tttttttt 2040
gttgcgtatg ttattatgtt atcaaaatgtt acctttataa aacctgtt tttttttt 2100
gaggagaaaa aggagggaaa aaataaacctt actttttttt gatggaaaat gaaatgttgc 2160
ccacaaggaa accatgttca attaaatgtt aatgttgc tttttttt 2220
gagcatttgc aaaaatctgtt ttcaacttgc gatgttgc tttttttt 2280
aatatcgtt gtaaatcaac tactaacaat cttttttt 2319

<210> 8
<211> 773
<212> PRT
<213> Streptococcus pneumoniae

<400> 8
Lys Leu Gly Glu Ile Ala Glu Ser Lys Phe Lys Asn Leu Gly Asn Gly
1 5 10 15
Lys Glu Gly Ser Leu Lys Lys Asp Thr Thr Gly Val Glu His His His
20 25 30
Gln Glu Asn Glu Glu Ser Ile Lys Glu Lys Ser Ser Phe Thr Ile Asp
35 40 45
Arg Asn Ile Ser Thr Ile Arg Asp Phe Glu Asn Lys Asp Leu Lys Lys
50 55 60
Leu Ile Lys Lys Lys Phe Arg Glu Val Asp Asp Phe Thr Ser Glu Thr
65 70 75 80
Gly Lys Arg Met Glu Glu Tyr Asp Tyr Lys Tyr Asp Asp Lys Gly Asn
85 90 95
Ile Ile Ala Tyr Asp Asp Gly Thr Asp Leu Glu Tyr Glu Thr Glu Lys
100 105 110
Leu Asp Glu Ile Lys Ser Lys Ile Tyr Gly Val Leu Ser Pro Ser Lys
115 120 125
Asp Gly His Phe Glu Ile Leu Gly Lys Ile Ser Asn Val Ser Lys Asn
130 135 140
Ala Lys Val Tyr Tyr Gly Asn Asn Tyr Lys Ser Ile Glu Ile Lys Ala
145 150 155 160
Thr Lys Tyr Asp Phe His Ser Lys Thr Met Thr Phe Asp Leu Tyr Ala
165 170 175
Asn Ile Asn Asp Ile Val Asp Gly Leu Ala Phe Ala Gly Asp Met Arg
180 185 190
Leu Phe Val Lys Asp Asn Asp Gln Lys Lys Ala Glu Ile Lys Ile Arg
195 200 205
Met Pro Glu Lys Ile Lys Glu Thr Lys Ser Glu Tyr Pro Tyr Val Ser
210 215 220
Ser Tyr Gly Asn Val Ile Glu Leu Gly Glu Gly Asp Leu Ser Lys Asn
225 230 235 240
Lys Pro Asp Asn Leu Thr Lys Met Glu Ser Gly Lys Ile Tyr Ser Asp
245 250 255
Ser Glu Lys Gln Gln Tyr Leu Leu Lys Asp Asn Ile Ile Leu Arg Lys
260 265 270

Gly Tyr Ala Leu Lys Val Thr Thr Tyr Asn Pro Gly Lys Thr Asp Met
 275 280 285
 Leu Glu Gly Asn Gly Val Tyr Ser Lys Glu Asp Ile Ala Lys Ile Gln
 290 295 300
 Lys Ala Asn Pro Asn Leu Arg Ala Leu Ser Glu Thr Thr Ile Tyr Ala
 305 310 315 320
 Asp Ser Arg Asn Val Glu Asp Gly Arg Ser Thr Gln Ser Val Leu Met
 325 330 335
 Ser Ala Leu Asp Gly Phe Asn Ile Ile Arg Tyr Gln Val Phe Thr Phe
 340 345 350
 Lys Met Asn Asp Lys Gly Glu Ala Ile Asp Lys Asp Gly Asn Leu Val
 355 360 365
 Thr Asp Ser Ser Lys Leu Val Leu Phe Gly Lys Asp Asp Lys Glu Tyr
 370 375 380
 Thr Gly Glu Asp Lys Phe Asn Val Glu Ala Ile Lys Glu Asp Gly Ser
 385 390 395 400
 Met Leu Phe Ile Asp Thr Lys Pro Val Asn Leu Ser Met Asp Lys Asn
 405 410 415
 Tyr Phe Asn Pro Ser Lys Ser Asn Lys Ile Tyr Val Arg Asn Pro Glu
 420 425 430
 Phe Tyr Leu Arg Gly Lys Ile Ser Asp Lys Gly Gly Phe Asn Trp Glu
 435 440 445
 Leu Arg Val Asn Glu Ser Val Val Asp Asn Tyr Leu Ile Tyr Gly Asp
 450 455 460
 Leu His Ile Asp Asn Thr Arg Asp Phe Asn Ile Lys Leu Asn Val Lys
 465 470 475 480
 Asp Gly Asp Ile Met Asp Trp Gly Met Lys Asp Tyr Lys Ala Asn Gly
 485 490 495
 Phe Pro Asp Lys Val Thr Asp Met Asp Gly Asn Val Tyr Leu Gln Thr
 500 505 510
 Gly Tyr Ser Asp Leu Asn Ala Lys Ala Val Gly Val His Tyr Gln Phe
 515 520 525
 Leu Tyr Asp Asn Val Lys Pro Glu Val Asn Ile Asp Pro Lys Gly Asn
 530 535 540
 Thr Ser Ile Glu Tyr Ala Asp Gly Lys Ser Val Val Phe Asn Ile Asn
 545 550 555 560
 Asp Lys Arg Asn Asn Gly Phe Asp Gly Glu Ile Gln Glu Gln His Ile
 565 570 575
 Tyr Ile Asn Gly Lys Glu Tyr Thr Ser Phe Asn Asp Ile Lys Gln Ile

580

585

590

Ile Asp Lys Thr Leu Asn Ile Lys Ile Val Val Lys Asp Phe Ala Arg
595 600 605

Asn Thr Thr Val Lys Glu Phe Ile Leu Asn Lys Asp Thr Gly Glu Val
610 615 620

Ser Glu Leu Lys Pro His Arg Val Thr Val Thr Ile Gln Asn Gly Lys
625 630 635 640

Glu Met Ser Ser Thr Ile Val Ser Glu Glu Asp Phe Ile Leu Pro Val
645 650 655

Tyr Lys Gly Glu Leu Glu Lys Gly Tyr Gln Phe Asp Gly Trp Glu Ile
660 665 670

Ser Gly Phe Glu Gly Lys Lys Asp Ala Gly Tyr Val Ile Asn Leu Ser
675 680 685

Lys Asp Thr Phe Ile Lys Pro Val Phe Lys Lys Ile Glu Glu Lys Lys
690 695 700

Glu Glu Glu Asn Lys Pro Thr Phe Asp Val Ser Lys Lys Lys Asp Asn
705 710 715 720

Pro Gln Val Asn His Ser Gln Leu Asn Glu Ser His Arg Lys Glu Asp
725 730 735

Leu Gln Arg Glu Glu His Ser Gln Lys Ser Asp Ser Thr Lys Asp Val
740 745 750

Thr Ala Thr Val Leu Asp Lys Asn Asn Ile Ser Ser Lys Ser Thr Thr
755 760 765

Asn Asn Pro Asn Lys
770